

What is claimed is:

1 1. A method for frequency conversion in a receiver,
2 comprising the steps of:
3 receiving a signal having a radio frequency and
4 carrying information on a plurality of channels;
5 selecting one of the channels;
6 converting the signal from the radio frequency to a
7 first variable frequency determined by the
8 selected channel; and
9 converting the signal from the first frequency to a
10 second frequency.

1 2. The method as claimed in claim 1, wherein the
2 first frequency is determined so that noise coupled from the
3 other channels into the selected channel is minimized.

1 3. The method as claimed in claim 1, wherein the
2 first frequency is higher than the radio frequency.

1 4. The method as claimed in claim 1, wherein the second
2 frequency is fixed for all the channels.

1 5. The method as claimed in claim 1, wherein the
2 second frequency is a baseband frequency.

1 6. The method as claimed in claim 1 further
2 comprising the step of:
3 converting the signal from the second frequency to a
4 third frequency.

1 7. The method as claimed in claim 6, wherein the
2 first frequency is determined to minimize noise coupled from
3 the other channels into the selected channel.

1 8. The method as claimed in claim 6, wherein the
2 first frequency is higher than the radio frequency.

1 9. The method as claimed in claim 6, wherein the
2 second frequency is fixed for all the channels.

1 10. The method as claimed in claim 6, wherein the
2 second frequency is lower than the first frequency.

1 11. The method as claimed in claim 6, wherein the
2 third frequency is fixed for all the channels.

1 12. The method as claimed in claim 6, wherein the
2 third frequency is a baseband frequency.

1 13. A receiver comprising:
2 an antenna receiving an RF signal carrying information
3 on a plurality of channels;
4 a first local oscillator generating a first oscillating
5 signal having a first frequency;
6 a first mixer mixing the RF signal with the first
7 oscillating signal to generate an intermediate
8 signal;
9 a second local oscillator generating a second
10 oscillating signal having a second frequency; and
11 a second mixer mixing the intermediate signal with the
12 second oscillating signal to generate a baseband
13 signal;

14 wherein a frequency of the intermediate signal is
15 variable and determined by the selected channel.

1 14. The receiver as claimed in claim 13, wherein the
2 frequency of the intermediate signal is determined so that
3 noise coupled from the other channels into the selected
4 channel is minimized.

1 15. The receiver as claimed in claim 13, wherein the
2 first oscillator comprises:

3 a first frequency divider dividing a frequency FR of a
4 reference signal by a divisor N;
5 a phase frequency detector having a first input coupled
6 to an output of the first frequency divider;
7 a charge pump having an input coupled to an output of
8 the phase frequency detector;
9 a loop filter having an input coupled to an output of
10 the charge pump;
11 a voltage controlled oscillator having an input coupled
12 to an output of the loop filter;
13 a second frequency divider dividing a frequency of a
14 signal output from the voltage controlled
15 oscillator by a divisor P and outputting the
16 first oscillating signal; and
17 a frequency multiplier multiplying the first
18 oscillating signal by a multiplicator M and
19 having an output coupled to a second input of the
20 phase frequency detector.

1 16. The receiver as claimed in claim 15, wherein the
2 divisors N and P, and the multiplicator M are determined by
3 the selected channel.

1 17. The receiver as claimed in claim 13 further
2 comprising a low noise amplifier coupled between the antenna
3 and the first mixer to amplify the RF signal.

1 18. The receiver as claimed in claim 13 further
2 comprises a SAW driver coupled to an output of the second
3 mixer.

1 19. The receiver as claimed in claim 13, wherein the
2 first and second mixers are image rejection mixers.

1 20. A receiver comprising:
2 an antenna receiving an RF signal carrying information
3 in a plurality of channels;
4 a first local oscillator generating a first oscillating
5 signal having a first frequency;
6 a first mixer mixing the RF signal with the first
7 oscillating signal to generate a first
8 intermediate signal;
9 a second local oscillator generating a second
10 oscillating signal having a second frequency;
11 a second mixer mixing the first intermediate signal
12 with the second oscillating signal to generate a
13 second intermediate signal;
14 a third local oscillator generating a third oscillating
15 signal having a third frequency; and

16 a third mixer mixing the second intermediate signal
17 with the third oscillating signal to generate a
18 baseband signal;
19 wherein a frequency of the first intermediate signal is
20 variable and determined by the selected channel.

1 21. The receiver as claimed in claim 20, wherein the
2 frequency of the first intermediate signal is determined so
3 that noise coupled from the other channels into the selected
4 channel is minimized.

1 22. The receiver as claimed in claim 20, wherein each
2 of the first and second oscillator comprises:
3 a first frequency divider dividing a frequency FR of a
4 reference signal by a divisor N;
5 a phase frequency detector having a first input coupled
6 to an output of the first frequency divider;
7 a charge pump having an input coupled to an output of
8 the phase frequency detector;
9 a loop filter having an input coupled to an output of
10 the charge pump;
11 a voltage controlled oscillator having an input coupled
12 to an output of the loop filter;
13 a second frequency divider dividing a frequency of a
14 signal output from the voltage controlled
15 oscillator by a divisor P and outputting the
16 first oscillating signal; and
17 a frequency multiplier multiplying the first
18 oscillating signal by a multiplicator M and

19 having an output coupled to a second input of the
20 phase frequency detector.

1 23. The receiver as claimed in claim 22, wherein the
2 divisors N and P, and the multiplicator M are determined by
3 the selected channel.

1 24. The receiver as claimed in claim 20 further
2 comprising a low noise amplifier coupled between the antenna
3 and the first mixer to amplify the RF signal.

1 25. The receiver as claimed in claim 20 further
2 comprises a SAW driver coupled to an output of the third
3 mixer.

1 26. The receiver as claimed in claim 20, wherein the
2 first, second and third mixers are image rejection mixers.